

Work Order ID 67862

Friday, April 01, 2011 1:48:50 PM



Page 1

Item ID: D212-664-101TRN

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Turning Detail

Start Date: 4/1/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 4/6/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan:

CD

Date: 11/04/01

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr

Revision Nbr

D212-664-141

Rev D

100

0.00



Mori Seiki

MORI SEIKI CNC LATHE LARGE

Memo

0.00

OK 11/04/01

1 *0*

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA113
2-Turn first side as per Folio FA113
3-File down transition lines smooth.

110

0.00



QC

QC1- Inspect dimensions to dimension sheet

Memo

0.00

OK 11/04/02

1 *0*

Quality Control

120

0.00



Mori Seiki

MORI SEIKI CNC LATHE LARGE

Memo

0.00

OK 11/04/02

1 *0*

Mori Seiki CNC Lathe Large

1-Turn second side as per Folio FA113
2-File down transition lines smooth.
3-Remove sand and plugs

| W/O: | | WORK ORDER CHANGES | | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|--|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector | |
| | | | | | | | | |
| | | | | | | | | |

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
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NOTE: Date & initial all entries

Work Order ID 67862

Friday, April 01, 2011 1:48:50 PM



Page 2

Item ID: D212-664-101TRN

Accept



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Revision ID:

Stop



Item Name: Crosstube Turning Detail

Start Date: 4/1/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 4/6/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: Date:

Tooling: Date:

Run Start



QC: Date:

SPC (Y/N): Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

130

QC1- Inspect dimensions to dimension sheet

0.00



QC

Memo

0.00

only 11/04/02

Quality Control

140

QC8- Inspect parts - second check

0.00



QC

Memo

0.00

2/14/4

Quality Control

150

Crosstubes Chemical Conversion

0.00



HandFXtube

Memo

0.00

DP

11-4-4

Hand Finishing Crosstubes

| W/O: | | WORK ORDER CHANGES | | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|--|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector | |
| | | | | | | | | |
| | | | | | | | | |

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
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| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
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NOTE: Date & initial all entries

Work Order ID 67862

Friday, April 01, 2011 1:48:50 PM

Page 3

Item ID: D212-664-101TRN

Accept

Revision ID:

Item Name: Crosstube Turning Detail

Setup Start

Stop

Start Date: 4/1/2011 Start Qty: 1.00

Required Date: 4/6/2011 Req'd Qty: 1.00

Cust Item ID:

Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start

QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool # Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

160

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control

BE (a/b) 11/04/04

170

Packaging

0.00



Packaging

Memo

0.00

Packaging

Identify and Stock in kanban rack
Location: 46

DP

11-4-4

180

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

11/4/4

11-04-4

| W/O: | | WORK ORDER CHANGES | | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|--|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector | |
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
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| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

NOTE: Date & initial all entries

Picklist Print

Friday, April 01, 2011 1:48:48 PM

Page 1

Work Order ID: 67862

Parent Item: D212-664-101TRN

Parent Item Name: Crosstube Turning Detail



Start Date: 4/1/2011

Required Date: 4/6/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A 08-03-06 new issue DD verified by:ec
IPP Rev B 08.04.02 removed Polish EC verified by: DD

| Component Item ID/ Item Name | Replacement Item ID | Mfg/ Purch | Bin Item | Primary Location | Last Location | Route Seq ID | Unit of Measure | Qty on Hand | Qty per Kit | Total Qty | Qty Issued | Date Issued | Status |
|---------------------------------|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|--------------|---------------|----------------|--------|
|---------------------------------|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|--------------|---------------|----------------|--------|

D6005-128

Manufactured No

120

Each

14.0000

1

1



Crosstube Material

Location

Loc Qty

Loc Code

LG

14

57911

14

1 *and n/o 4/01*

| W/O: | | WORK ORDER CHANGES | | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|--|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector | |
| | | | | | | | | |
| | | | | | | | | |

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
| | | | | | | | | |
| | | | | | | | | |
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NOTE: Date & initial all entries

8 7 6 5 4 3 2 1



| Item | Qty -141 | Qty -141B | Part Number | Description |
|------|-------------|--------------|----------------|---|
| 1 | X | | D212-664-141 | CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD) |
| 2 | | X | D212-664-141B | CROSSTUBE ASSEMBLY (214 HIGH FWD) |
| 3 | 1 | 1 | D6005-128 | CROSSTUBE |
| 4 | 2 | 2 | D2893-1 | SUPPORT |
| 5 | 4 | 4 | D3595-063-450 | RUBBER CUSHION |
| 6 | 4 | 4 | MS21920-25 | CLAMP (OR MS21920-26) |
| 7 | A/R | A/R | MAGNOBOND 6398 | ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE) |

GENERAL NOTES:

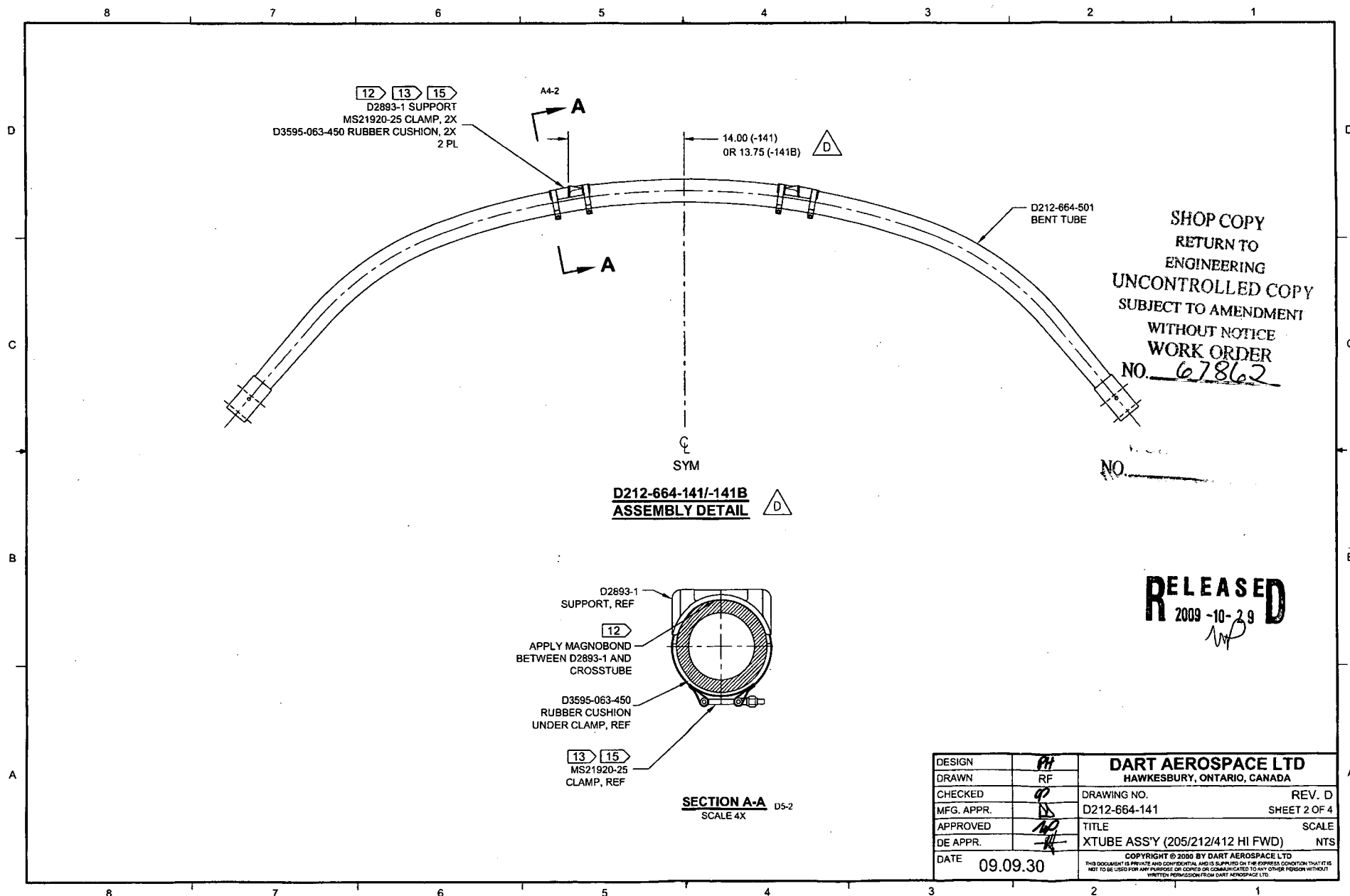
- 1) MATERIAL: MANUFACTURED FROM D6005-128
FINISHED LENGTH = 126.514±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF
USING VIBRATING STYLUS
- 7) WEIGHT: D212-664-141 = 33.6 lbs (PER IIN-D212-664)
D212-664-141B = 33.6 lbs (PER IIN-D212-664)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS
6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF
D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER
INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2893-1
SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE
SUPPORT.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE
SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR
DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND
MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT
HAS NOT BOTTOMED-OUT AFTER TORQUING.

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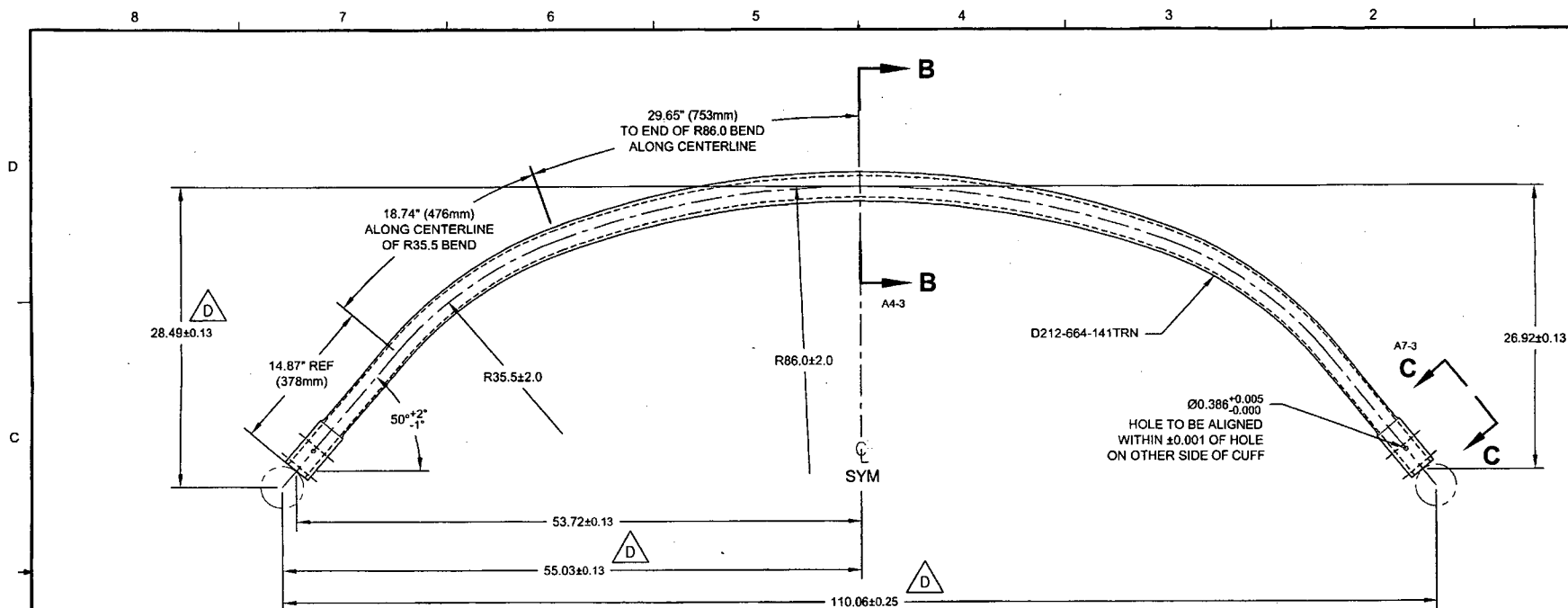
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|------------|--|--|--------------|
| D | REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -141B (ZN B4-2, D4-2); REMOVED REF & ADD TOLERANCES (ZN B4-3, C6-3, C8-3 & B6-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4 | RF | 09.09.30 |
| C | REMOVE -851 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS | PH | 07.03.08 |
| B | ADD HOLES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES | PH | 05.02.04 |
| A | NEW ISSUE | PH | 00.12.12 |
| REV. | DESCRIPTION | BY | DATE |
| DESIGN | PH | DART AEROSPACE LTD | |
| DRAWN | RF | HAWKESBURY, ONTARIO, CANADA | |
| CHECKED | PH | DRAWING NO. | REV. D |
| MFG. APPR. | PH | D212-664-141 | SHEET 1 OF 4 |
| APPROVED | PH | TITLE | SCALE |
| DE APPR. | PH | XTUBE ASS'Y (205/212/412 HI FWD) | NTS |
| DATE | 09.09.30 | COPYRIGHT © 2000 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR IN ANY MANNER WITHOUT THE WRITTEN PERMISSION FROM DART AEROSPACE LTD. | |

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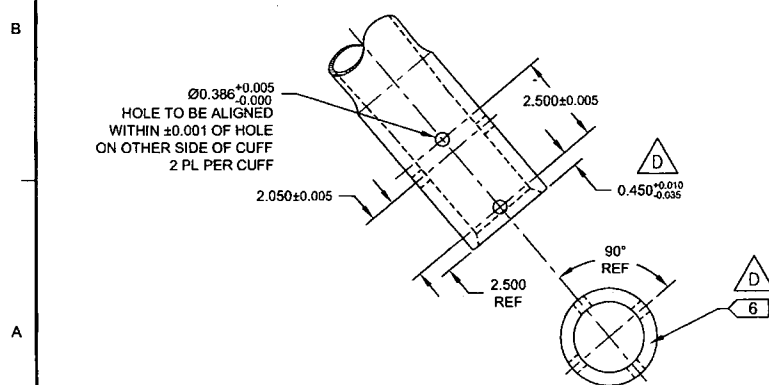


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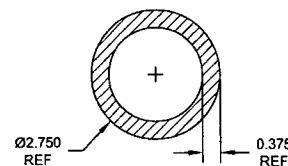
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| DRAWN | RF | HAWKESBURY, ONTARIO, CANADA | |
| CHECKED | 97 | DRAWING NO. | REV. D |
| MFG. APPR. | DS | D212-664-141 | SHEET 2 OF 4 |
| APPROVED | 140 | TITLE | SCALE |
| DE APPR. | 14 | XTUBE ASS'Y (205/212/412 HI FWD) | NTS |
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D212-664-501
BENDING AND DRILLING DETAIL



VIEW C-C: CUFF DETAIL C2-3
 SCALE 3X

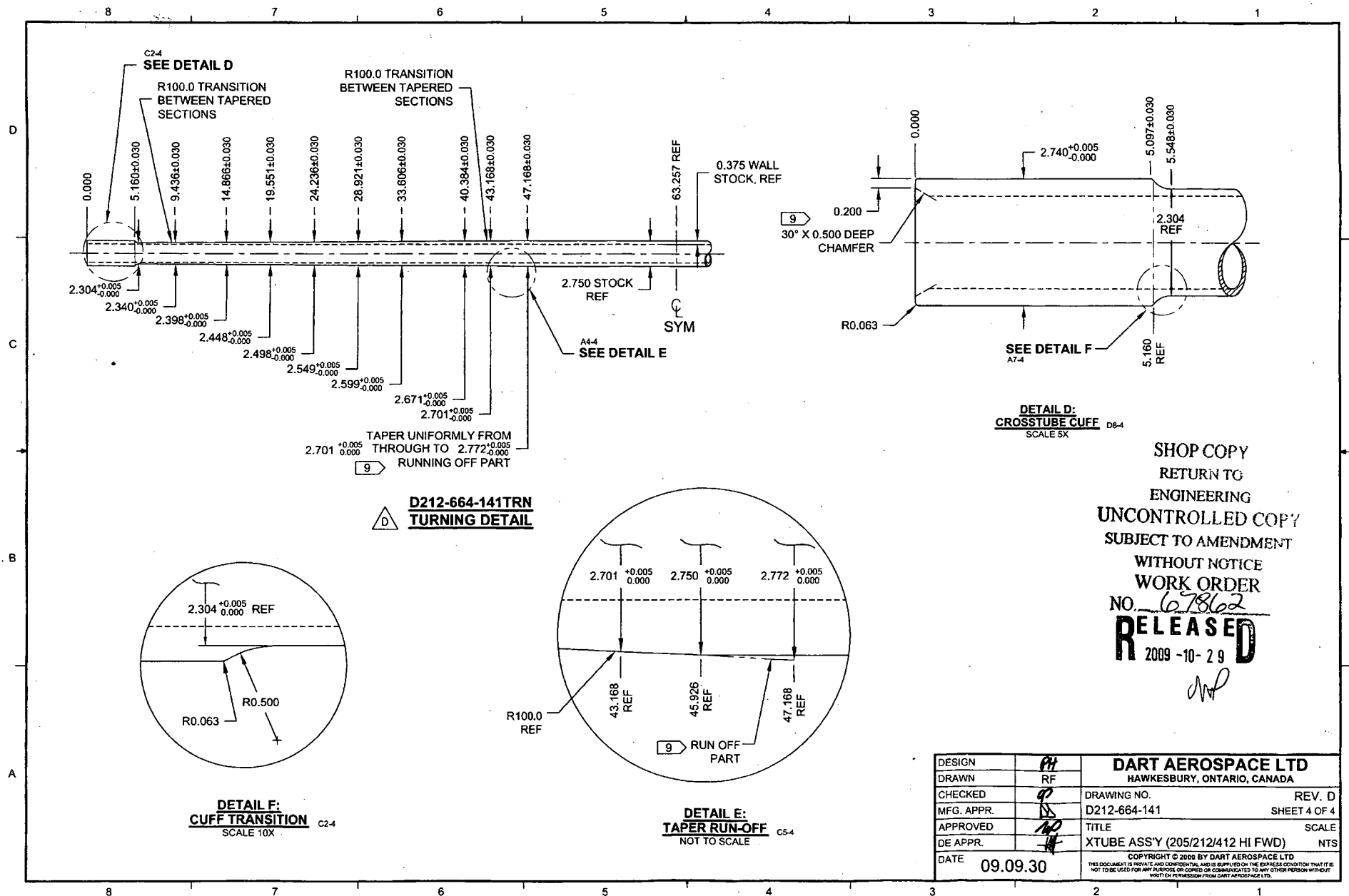


SECTION B-B C4-3
 SCALE 4X

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| DRAWN | RF | HAWKESBURY, ONTARIO, CANADA | |
| CHECKED | Q | DRAWING NO. | REV |
| MFG. APPR. | DS | D212-664-141 | SHEET 3 |
| APPROVED | MP | TITLE | SCALE |
| DE APPR. | MP | XTUBE ASS'Y (205/212/412 HI FWD) | |
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| DRAWN | RF | HAWKESBURY, ONTARIO, CANADA | |
| CHECKED | Q | DRAWING NO. | REV. D |
| MFG. APPR. | NS | D212-664-141 | SHEET 4 OF 4 |
| APPROVED | 10 | TITLE | SCALE |
| DE APPR. | 10 | XTUBE ASSY (205/212/412 HI FWD) | NTS |
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|---|---------------------|--------------|
| DART AEROSPACE LTD | Work Order: | 67862 |
| Description: Crosstube Assembly (205/212/412 High Fwd) | Part Number: | D212-664-141 |
| Inspection Dwg: D212-664-141 Rev: D | | Page 1 of 1 |

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

| Inspection Sheet Drawing Dimension | Tolerance | Actual Dimension | Accept | Reject | Method of Inspection | Comments |
|---------------------------------------|-----------|---------------------|---------|--------|-------------------------|-------------|
| SIDE A | 0.200 | +/-0.010 | 2.205 | ✓ | | Vern HL-7 |
| | R0.063 | +/-0.010 | R.063 | ✓ | | Rad-gage |
| | 2.740 | +0.005/-0.000 | 2.745 | ✓ | | Micr CXL-04 |
| | 5.097 | +/-0.030 | 5.097 | ✓ | | Vern HL-7 |
| | 2.304 | +0.005/-0.000 | 2.308 | ✓ | | Micr CXL-04 |
| | 2.340 | +0.005/-0.000 | 2.342 | ✓ | | " |
| | 2.398 | +0.005/-0.000 | 2.402 | ✓ | | " |
| | 2.448 | +0.005/-0.000 | 2.451 | ✓ | | " |
| | 2.498 | +0.005/-0.000 | 2.501 | ✓ | | " |
| | 2.549 | +0.005/-0.000 | 2.554 | ✓ | | " |
| | 2.599 | +0.005/-0.000 | 2.604 | ✓ | | " |
| | 2.671 | +0.005/-0.000 | 2.675 | ✓ | | " |
| | 2.701 | +0.005/-0.000 | 2.705 | ✓ | | " |
| | | | | | | |
| SIDE B | 0.200 | +/-0.010 | 2.205 | ✓ | | Vern HL-7 |
| | R0.063 | +/-0.010 | R.063 | ✓ | | Rad-gage |
| | 2.740 | +0.005/-0.000 | 2.745 | ✓ | | Vern HL-7 |
| | 5.097 | +/-0.030 | 5.090 | ✓ | | " |
| | 2.304 | +0.005/-0.000 | 2.309 | ✓ | | Micr CXL-04 |
| | 2.340 | +0.005/-0.000 | 2.344 | ✓ | | " |
| | 2.398 | +0.005/-0.000 | 2.403 | ✓ | | " |
| | 2.448 | +0.005/-0.000 | 2.453 | ✓ | | " |
| | 2.498 | +0.005/-0.000 | 2.502 | ✓ | | " |
| | 2.549 | +0.005/-0.000 | 2.554 | ✓ | | " |
| | 2.599 | +0.005/-0.000 | 2.604 | ✓ | | " |
| | 2.671 | +0.005/-0.000 | 2.675 | ✓ | | " |
| | 2.701 | +0.005/-0.000 | 2.706 | ✓ | | " |
| | 126.514 | +/-0.020 | 126.530 | ✓ | | M-type HL-2 |

| | | | | | |
|---------------------|--------------------|--------------------|--------------------|----------------------------|-----|
| Measured by: | <i>[Signature]</i> | Audited by: | <i>[Signature]</i> | Prototype Approval: | N/A |
| Date: | 11/04/02 | Date: | 11/4/04 | Date: | N/A |

| Rev | Date | Change | Revised by | Approved |
|-----|----------|--|------------|--------------------|
| A | 05.04.27 | New Issue (P/O D412-664-101) | KJ/JLM | |
| B | 06.03.15 | Tolerance revised for 5.097 per Dwg Rev update | KJ/JLM | |
| C | 07.05.28 | Dwg Rev updated | KJ/JLM | |
| D | 10.02.02 | Dimension 126.514 was 126.51 | KJ | <i>[Signature]</i> |

27-10-1944
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